The MAC Flyer

OCTOBER 1972

MILITARY AIRLIFT COMMAND
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For Greater Efficiency
in MAC Air Operations

The MAC Flyer

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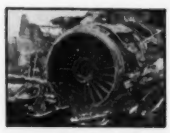

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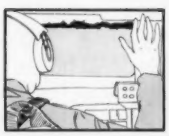

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COVER: For some, winter weather has begun . . . for others it soon will. Check page 4 for your survival guide.

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Squawk Box

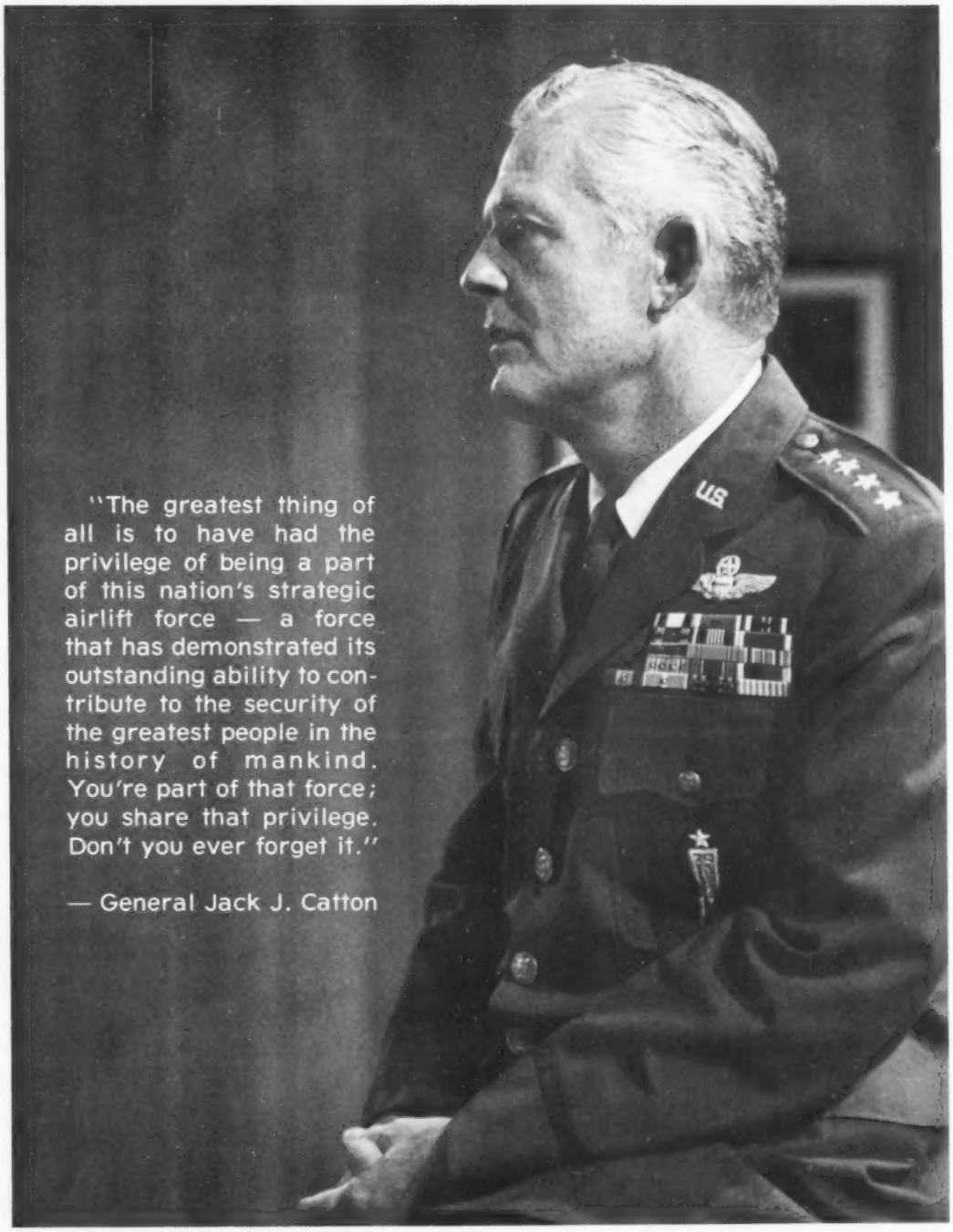
The commander put it this way: "What can we do to jazz up THE MAC FLYER?" His objective was to improve the flow of information from the aircraft operations experts and policy makers here, to the airplane operators out there, and his challenge was to get some heads together to produce ideas. On one hand, that sounded almost like a license to steal; on the other, it reminded us that we still have room for improvement. We knew the question demanded an answer, so we closeted ourselves with some outside talent and began brainstorming.

At the end of our session we had three pages of ideas. Some cost too much — like doubling the staff. Some we felt would hurt — like retiring C. R. Terror or trying to publish 48 pages monthly. And some wouldn't be acceptable to our financial backer — more freedom on controversial subjects; centerfold pinups. But almost 50 of the ideas were practical, possible, and cheap. A few of them — like including more people news — are already in effect (see "Global Notes"). Others — like more issues devoted to special topics and more features for our enlisted crewmen — are in the mill.

A number of ideas directly involved you, our reader: Get more inputs from the field; get more reader involvement; offer better rewards for contributors; solicit topics.

The big question, of course is: what are your thoughts on these items? Surely you've got plenty of ideas — if we could only find out what they are. As we said in our readership survey report (July), we'd like to be the magazine you want. But someone out there has got to invest in a postcard or an 8¢ stamp and help us tune in on the troops. Could *you* be the one?

a farewell



"The greatest thing of all is to have had the privilege of being a part of this nation's strategic airlift force — a force that has demonstrated its outstanding ability to contribute to the security of the greatest people in the history of mankind. You're part of that force; you share that privilege. Don't you ever forget it."

— General Jack J. Catton

MAC-man's Guide to Winter:

Pack a Snow Suit with

Your Swim Suit

IT MIGHT SOUND RIDICULOUS, but winter actually presents MAC aircrews with a thermal dilemma. We have to make a choice of what we need for a seven-day trip and then try to crunch it all into one B-4 bag. Should you pack your parka and mukluks or flip flops and swim suit? Seasoned MAC crews highly recommend both if you want to survive the trip.

While the northern hemisphere temperate zone is settling into colder temperatures for the season, SEA is still just as hot and humid as ever. In fact, your next Pacific trip might take you through all kinds of weather ranging from tropical breezes to arctic blizzards. This weather variance, especially the large temperature changes, can make a big difference in your personal performance as well as your aircraft's. Most of the difficulties you encounter in cold weather operation will be caused by one or more of the basic effects of low temperature, so let's look at some of the cold hard facts.

Metals

Most metals usually shrink (contract) at low temperatures and become harder and more brittle. This means failure of a metal part under a certain given stress is more likely to occur in a cold rather than warm environment. Also, because of the different coefficients of expansion (shrinkage rate) for different metals, cold weather can cause leakage at metal-to-metal seals, binding, looseness, sloppy controls, and even maladjustments which would not be evident at normal temperatures.

Rubber and Plastic

Rubber, neoprene, and plastics tend to harden and become brittle in cold temperatures. This loss of elasticity can cause failure of parts under lower than normal stresses, leakage of fluids at seals and gaskets, and even ruptures of diaphragms.

Liquids

Oils and hydraulic fluids usually become thicker and less effective in cooler weather. Extremely high oil pressures caused by thick undiluted oil can literally ruin an engine while the effectiveness of a hydraulically-operated mechanism can be drastically reduced.

Greases

Greases have much the same properties as oil and hydraulic fluid but generally are not used in pressure lubricated systems. The principal effect of cold grease in the mechanism concerned is more drag and less lubrication.

Fuel

The most noticeable effect of extreme low temperature on fuel is its increase in density. This, of course, is evident in the pounds per gallon weight of the fuel and is the reason you can cram more into fuel tanks in the winter. Another effect on fuel is the loss of its ability to vaporize at very low temperatures.

Water

Water is present in many of the systems and is a constant source of problems. When it freezes (at approximately 0°C) it expands, causing cracked blocks as well as ruptured pipes or lines. It can gain entrance to systems through condensation suspended in fuel or oil, and as a by-product of combustion.

Human Body

The effects of extremely low temperatures on the human body can be minimized by wearing proper clothing. Be sure to prepare for the coldest weather by checking out your cold weather gear early. Then you will have a choice of garments to fit the situation. Don't get frostbite because you didn't think.

Cold Weather Procedures

Extreme cold weather operating procedures are covered in your specific aircraft flight manuals, so review them before the really cold weather sets in. But right now let's look at some general problems confronting our flight operations.

Flight Planning

First of all, take a good look at the weather. Winter flying is not all bad, but you must know about the significant dangers involved. After you check on the destination and alternate weather, find out about the proposed route. If hazardous conditions prevail along one route, select another. Your flight altitude might also play a significant role in hazard potentials, so check the forecast and pilot reports of clear air turbulence, jet streams, and tropopause. If you must choose a flight altitude where structural icing is forecast, or even if you must climb or descend through icing conditions, figure on additional fuel for the heaters and weather alternates. Of course, if your bird uses electrical, bleed air, or exhaust anti-ice systems, you only have to worry about the additional alternate fuel. The weather fore-

caster doesn't have a runway condition reading forecast, but he can usually give a pretty good wag for your destination's RCR. After you check the notams and complete the normal flight planning chores, you're ready to think about the preflight.

Preflight Inspection

Even though a Dash Six preflight should have been accomplished by the ground crew, a flight crew walkaround is always good insurance. Make sure the tires are not frozen to the ground, and scan all control and airfoil surfaces for snow and ice. (Warning! Any significant accumulation must be removed from the airfoil surfaces prior to flight to prevent increased takeoff distance and excessive stalling speeds. Also, inflight structural damage can result from vibrations induced by these dangerous airflow disrupters.) Deicing fluid that falls within military specs is still your best tool for removal of frost and thin deposits of ice. This fluid does not contain alcohol and will not craze or soften plastics. In out-of-the-way places the cherry picker and deicing equipment might be difficult to find, so brooms might be used in removing snow and frost. Remember those icy surfaces are slick! Use safety harness, and avoid damage to control surface hinge areas. After ice and snow removal has been completed, ops check all controls, tabs, flaps, and spoilers. An inoperative flight control could spoil more than just your day.

A particularly careful inspection of the landing gear assembly is essential prior to departure. Frozen slush or congealed oil should be cleaned from struts and actuating cylinders. Exercise extreme caution when inflating air-oil or oleo struts. Use only nitrogen or dry air because regular compressed air contains moisture that can literally freeze up the works. Also examine the landing gear safety switches carefully. If they are frozen in the ground position you will lose their designed protection after takeoff.

Start

Reciprocating as well as jet engines require special preparation and precautions during cold weather operation. Both types of engines perform well in cold dense air; however, extensive damage can result if you don't follow a few simple procedures. Extremely thick oil reduces cranking speeds in addition to lubricating poorly and has been the blame of many failures of engine accessories.

Nacelle or engine preheating usually helps when starting a cold-soaked engine; however, don't overdo it on jet engines. For example, a maximum of ten minutes is recommended for cold-soaked C-141s.

About the most important engine gage in cold weather is the oil pressure instrument. Keep the power at idle or low torque until the oil pressure is within normal operating range. A sudden loss of oil pressure means trouble. It is usually due to a broken line or damaged seal, so act immediately. Shut down and investigate!

Taxi

Before you start taxiing, check around the ramp for slick spots or slush and, of course, avoid them. Thrust requirements for initial aircraft movement might be slightly more than you're used to using. However, after the aircraft is rolling you shouldn't notice much difference. Pilots should be careful not to blast the ground crew with excessive prop or jet wash. The chill factor

attacks everyone and frostbite takes its toll every winter.

Nose wheel steering, as always, will be the best method to use for all ground operations. Slow taxi speeds will assure good nose wheel control by eliminating skidding. Remember, the reported RCR might not be the same on the ramp as reported for the active runway. While taxiing in uncongested areas, cross-check all instruments for proper operation. Sluggish ones can be warmed up more rapidly by turning on the instrument lights. Avoid taxiing in deep snow or slush because brakes and gear may freeze after takeoff.

If your aircraft requires an engine runup or power check, park on a dry portion of the runup area to prevent sliding into another aircraft or off the prepared surface.

Takeoff

A check on the crosswind component just before takeoff is good management in any language. Remember, a low RCR proportionately decreases the maximum crosswind you can handle. Directional control of our four-engine transports as well as the smaller birds might become very tricky.

Slush and water puddles on the runway can cause significant structural damage to aircraft traveling at high speeds. If possible (without dragging a wingtip or doing 360s on the runway) avoid water puddles and slush. An instance is on record where puddles and running water from one to four inches deep increased a C-141 takeoff roll by over 25 percent.

Ground aborts will require more than average skill and cunning if the runway is slick. If you must abort at high speed, reverse thrust is still the best stopper; however, be careful. At slower speeds, on loose snow or in ice fog conditions, the visibility can be reduced to zero. You could find out what it's like to be IFR on the runway.

Airborne

Now you are finally airborne and must consider in-flight icing. Most MAC aircraft have built-in anti-icing or deicing systems. Some have a combination of both. We'll talk about the icing problems later, but right now let's classify icing into two categories, *induction* and *structural*. This sounds simple enough, but what are the real hazards?

Induction

Carburetor or induction system icing can be a most unpleasant surprise to the unwary crewmember. It is usually very illusive until the conditions are right to strike. Then almost immediately after ice accumulation starts, power is seriously affected. Complete power loss could occur if *immediate* corrective steps are not taken.

Jet and reciprocating engines can both suffer a freeze up without visible wing icing. Adiabatic expansion reduces the temperature in the engine inlet allowing ingested water droplets to impinge and freeze on engine inlet components. Carburetor icing on recips is most common when the OAT is between +15°C and −10°C. In jets the induction icing is more likely during ground and takeoff operations when the aircraft velocity is low or zero and engines are at high thrust. It is also a problem during delays at low thrust. Even ice detection systems may not detect engine ice formations. Once you recognize the induction icing symptoms, take immediate actions to prevent it from forming or to eliminate it if it's already formed.

The carburetor preheat system on reciprocating engines is the best protection against carburetor icing. Manifold pressure fluctuations, torque pressure drops, and erratic fuel flow indications spell trouble with a big "T." Carburetor heat will probably eliminate even the most severe icing, but why wait for a power loss? Use the heat before the power is affected and stay on the safe side.

On the other hand the jet engine is a little less susceptible to induction icing than its reciprocating brother, but you must take preventive measures. When visible moisture is present at temperatures near 10°C or lower, consider using engine anti-icing. On engines similar to the C-141 the continuous ignition system will help assure continued operation. Ice buildup on the nacelle leading edge or nose cone will have very little effect on engine performance unless large amounts (greater than 1/2 inch) accumulate. These ice buildups are potentially hazardous as engine stall might occur and compressor damage may result when the ice is ingested. You should make every effort to depart the icing conditions as soon as possible.

Structural

Structural icing, in the form of clear, rime, or mixed, can form on any exposed surface of the aircraft. The weather forecasters presently break the intensity down as a trace, light, moderate, and severe in order of increasing severity. Any accumulation of icing is extremely hazardous because it reduces aerodynamic efficiency by increasing drag, decreasing lift, and adding extra weight.

Either the anti-icing or deicing system will generally protect you, but most aircrew members prefer the anti-icing method. The anti-icing system *prevents ice from forming* while the deicing system eliminates the ice *after* it is formed. Anti-icing systems, whether fuel, electrical,

or bleed air operated, should be turned on before entering icing conditions. However, if icing catches you without the system operating, the anti-icer will usually deice the affected surface. Flights should not be planned through forecast or known *severe* icing conditions because neither system was designed to handle it.

Any type of ice disrupts the aerodynamic air-flow, thereby requiring an increased angle of attack. This higher angle exposes more bottom wing which accumulates more ice, requiring even more angle of attack. Considerable accumulations could easily require an angle of attack that would stall the aircraft.

Freezing rain or drizzle, similar to clear ice caused by supercooled water, should be avoided at all times. The accumulation could become uncontrollable in a very short time.

Rime icing is dangerous, but generally accumulates much slower than the clear type. It is usually encountered in stable stratus clouds having a low moisture content.

If, after using all available methods of evading icing you still encounter heavy icing conditions, try increasing your airspeed. This increased speed sublimates the ice and helps dissipate it faster. The best advice is to *avoid all icing conditions, whenever practicable.*

Penetration, Approach and Landing

Get the latest weather observation and short range forecast before starting your descent. If icing is expected or reported in the lower levels, turn on the heaters or anti-icers. Plan your descent to pass through the potential icing areas as rapidly as possible. Be sure to get a good reading on the ceiling, visibility, and wind. If the destination base is reporting a partial obscuration with a higher cloud ceiling — Beware! During operation in or around any obscuration your effective pilot ceiling will usually be less than reported. Any time a restriction such as dust, blowing snow, precipitation, smoke, or haze is reported, be prepared for the unexpected.

Several years ago one of our Starlifter crews found out that poor visibilities and obscured ceilings can be a menace. They were making a circling approach at Elmendorf when the right wingtip and number four engine clipped the tops of several trees. The actual weather conditions along the circling approach pattern turned out to be considerably lower than those reported by approach control and the tower. Luckily the mishap was only an incident, but the accident potentials of an obscuration were all present and accounted for.

Crosswinds also present many landing problems during the winter months because of increased pressure gradients in the weather systems. Check your Dash One for proper procedures. An extreme wing-low, no-crab approach and touchdown in a C-141 or C-135 at maximum crosswinds can be disastrous. You can survive the maximum crosswinds only if you use recommended procedures.

Slick runways can also affect your control in a crosswind landing. Request the RCR from approach control or tower because it plays an important part in your decision to land. Even without a crosswind you must be skillful and use good reversing techniques on slick runways. Reverse thrust is most effective at high speeds, so use it while you still have plenty of runway left. Asymmetrical reverse thrust should aid in maintaining aircraft control until the nose wheel steering stabilizes. However, as in aborts, loose snow might blow in front of the aircraft as speed decreases. Watch for it and keep on the centerline because some bases only clear a portion of the runway. This centerline track will also help you keep an engine pod or wingtip from hitting the runway during a crosswind landing on a crowned runway. By all means be sure to check your brakes and traction before the runway disappears under the nose.

Taxi and Park

You should taxi back to the ramp with the same precautions as the initial taxi to takeoff. It is difficult to judge snow depth from the cockpit and often taxiways are poorly marked. A snow windrow that looks shallow and soft may turn out to be hard enough and deep enough to cause loss of directional control or damage to the undercarriage. While taxiing on icy or snowy surfaces, the aircraft will not respond as readily to normal turning forces; therefore, steering corrections require a wide radius of turn.

After blocking in check the wheel chocks. Conventional chocks are out of style on packed snow or ice, so, if available, ice grip chocks should be used. To minimize the difficulties usually encountered in starting reciprocating engines, the engine oil should be diluted with fuel before shutting down the engines. Allow the oil temperature to cool first because fuel introduced into a hot system vaporizes. Usually an oil temperature of 50°C or below is satisfactory. After shutdown, most Dash Ones recommend releasing the parking brakes because freezing slush or water in the brake housing makes it most difficult to taxi.

Summary

We have examined numerous winter weather hazards but actually they are not new or alarming. We have survived the winters in the past and with a little luck and a lot of continued concern will surely survive this one. A little bit of extra preparation and prethought will assure you a successful flight. Keep a cool head and a positive attitude. Don't let your air machine turn into a multimillion dollar snow plow.

GOOD SHOW

MILITARY AIRLIFT COMMAND

Land gear up! Yikes! It's not often that a pilot lands gear up and is not admonished for it. But . . .

CAPT ROBERT F. DELY, Det 3, 9 Wea Recon Wg, Yokota Air Base, Japan, recently had no other choice unless he wanted to punch out. He and his navigator, Lt Col Kazuto Tomoyasu, were on a night local proficiency flight when their problem occurred. During an instrument approach to a local area field, the right main landing gear would not extend. Capt Dely attempted to recycle the stubborn gear but it still would not extend. He returned to Yokota and contacted the command post. For the next three hours Capt Dely talked to experts on the ground via conference calls, and following their advice tried every conceivable emergency procedure, including shutting down number two engine, bleeding the hydraulic pressure off, and hand pumping the gear down. But nothing worked.

Finally the decision — land gear up! Base fire fighters foamed the runway and Capt Dely made a low pass over the field, jettisoning the canopy. Now for a night blackout (the landing lights are on the gear) wheels up landing. With the canopy off he made his gear up approach and landing. Capt Dely touched down just inside the foam and slid to a halt, with 300 feet of foam remaining. His astute airmanship kept damage to a minimum — only sheet metal repair and the replacement of a few antennas were required to make the airmachine operational again.

COMAC cited Capt Dely by saying, "Your skillful and positive control in landing the aircraft with no landing lights onto the provided foam path minimized damage to a valuable Air Force resource. I congratulate you for your professional performance." To this THE MAC FLYER adds its "Good Show!"

Propane Dispensers:

A Little Bit of Gas Can Raise the Ceiling

EVER APPROACH YOUR DESTINATION AIRPORT in a beautiful bright sunny sky? The airborne visibility is 50+ and you can see the snow covered mountains surrounding your valley base from an unlimited distance. Then you check with base weather and find the field is zero-zero in fog. You know there is nearly two miles of concrete waiting below, but because of that soft, white blanket it might as well be a million miles away.

There's nothing left for you to do now but start for your alternate, because conditions on the ground aren't going to improve until mother nature's natural phenomenon changes sufficiently enough to dissipate the fog bank. This normally takes hours and sometimes even days. But now, thanks to Air Weather Service's (AWS) weather modification processes, one type of fog can be dispersed at man's will.

Types of Fog

The restriction to visibility known as fog comes in three different types. First, there is warm fog, which consists of liquid droplets suspended in air at temperatures above freezing (0°C). It is quite stable and comprises a large percentage of the total weather problem hindering military and civilian aviation operations. Next, there is ice fog. This is the rarest type and is normally found only in Arctic conditions where the temperatures are below −30°C. It is composed of very tiny ice crystals which are in a stable state. The third type, known as cold or supercooled fog, accounts for about five percent of all fog. Though not a large percentage, this type is common during the winter months in the northwestern United States, Alaska, and central Europe, and often terminates flying activities in these locations.

Cold fog consists of suspended water droplets in air at temperatures between 0°C and −30°C. In this environment the droplets are semistable and subject to nearly instantaneous freezing when contacted by a piece of ice or artificial ice nucleant. Though we can't do much about warm and ice fog, we now have practical operational methods for dissipating cold fog. Although somewhat marginal when temperatures are near freezing, the technique is very reliable at −2°C and below.

Airborne System

For the past five winters, AWS has been testing and operationally using airdropped crushed dry ice to dissipate cold fog. These seeding operations have been extremely successful and have greatly reduced mission delays and diversions. However, airborne seeding is expensive and requires approximately a two-hour lead time.

Ground Based System

Shortly after development of the airborne system, AWS began work on a ground based cold fog dissipating system. After studying the liquid propane operation developed by the French at Orly Airport near Paris, AWS envisioned a remote controlled fixed base propane system. Their first test system was installed at Fairchild AFB in 1968-69. This propane dispenser network consisted of 21 500-gallon dispensers positioned 2,000 to 3,000 feet apart and located at various distances upwind of the runway approach zone. The propane was turned on and off by hand and dispensed through a vaporizing nozzle attached to a 20 foot vertical pipe. This required an individual to drive to each tank to activate and terminate the seeding. Rather basic, but it worked.

The propane method of fog dissipation is based on the principle that cold fog can easily be converted into frozen precipitation by injecting liquid propane into the air as an aerosol spray. The propane immediately vaporizes, cooling a small area to a temperature colder than −40°C, and generates ice crystals in the supercooled fog. Once formed, the ice crystals continue to grow at the expense of the liquid water droplets. Eventually, they reach a size large enough to precipitate as small snow flakes, which in turn improves the visibility.

The ground based propane system operation at Fairchild proved to be as effective as the airborne system. Strategic Air Command documented a cost savings of over $232,000 during the first year of operation. Each year AWS has modified the Fairchild system using it as a test bed. It is now partly remote controlled and dispenses at a rate of 10 gallons per hour per each dispenser. This has proved to be the most efficient rate. Although any number of dispensers can be used at a

given time, AWS has found that only three to six are required to provide adequate field clearing.

European Test

Based on the success at Fairchild, a second ground based propane system was installed at Hahn AB, Germany, during 1970-71. The results of this test were inconclusive because of some unexpected problems with the quality of European propane and because of an insufficient number of seeding opportunities; however, the propane problem has been corrected, and operational testing will continue this winter. The Hahn system is equipped with manually operated dispensers. This arrangement is time-consuming and a lead time similar to that of the airborne system is required.

Remote Controlled System

In January 1972, AWS installed a fully remote controlled propane seeding system at Elmendorf AFB. It is scheduled to replace the very successful WC-130 airborne operation. This radio-controlled 19-dispenser network promises several advantages over the airborne and previous ground based systems.

First, it has a much quicker response time because the radio operated dispensers can be activated by remote control within five minutes from the time a request is received, and fog dispersal will be complete within 30 to 45 minutes. Airborne operations have a response time of at least 45 minutes for a ground launch and 15 minutes to prepare for seeding, plus 30 to 45 minutes more for fog dispersal. Second, since the airborne operation requires aircraft, crews, and maintenance personnel TDY to Elmendorf for three months of the year, the annual operating cost is considerably larger than that of the propane system. A third advantage is the fog dispersing season is extended from a three-month (mid-November to mid-February) period to a seven-month (1 October to 30 April) season which will cover all months when cold fog can possibly occur at Elmendorf.

Participation

It is now up to you, the crewmember, to request fog dispersal if the field is going to be below minimums on your arrival. Fields with fog dissipating capability require an accurate knowledge of your ETA and departure since fog dissipation is scheduled for each takeoff and landing. You must contact your destination base two hours prior to arrival and then update your ETA again one hour out so that seeding can be initiated at the proper time to avoid delays. This notification is required because of the system's operational reaction time.

This winter, ground-based fog dissipating systems will be in operation at Elmendorf, Fairchild, and Hahn. If you are inbound to one of these bases ask for fog dispersal. The Air Weather people will be glad to show you how a little gas can raise the ceiling.

Global Notes

new crew galleys

Our C-141s assigned to the 438th MAWg now have glass fiber prototype crew galleys installed. The workers in the 438th Field Maintenance Squadron Plastic Shop at McGuire built these galleys. The new galleys are more durable than the original metal ones and are far less expensive.

flies accident-free

The 41st Military Airlift Squadron, Charleston AFB, was recently honored for completing 300,000 accident-free flying hours. Maj Gen Roland A. Campbell, Commander 21st AF, presented the 41st Military Airlift Squadron with a MAC Outstanding Flight Safety Plaque. The squadron has maintained an accident-free record since 1962 and recently was named MAC's Outstanding Airlift Squadron for 1971.

MAC OISA winner

Lt Col James L. Earl, Jr., 4 MASq, received a MAC Outstanding Individual Safety Award for his initiative and ingenuity in preventing a nose gear up landing of a C-141.

wright wins award

The Chief of Staff Individual Safety Award was won by Major Carroll L. Wright, Chief of Safety for the 40th Aerospace Rescue and Recovery Wing. This award is given to the Air Force member who has made the greatest contribution to safety within the Air Force. During 1971, the 40th ARRWg was accident-free in flight and explosives categories, and posted outstanding ground safety rates. The 40th won the USAF Flight Safety Plaque and the following MAC awards: Flight Safety Achievement, Ground Safety Achievement and Special Award for Ground Safety (recognizing the best ground safety performance in MAC).

record setters

During 1971 members of the 54th Weather Reconnaissance Squadron set new records for flying time in their classified Southeast Asia project. They also set a record for storm flying hours, storm fixes, and storm missions, and achieved the highest success rate in the history of its fog dispersal project at Elmendorf AFB, Alaska.

pat on the back

Captain Benjamin J. Pearson II, Det 5, 44 ARRSq, Tyndall AFB, FL, received a congratulatory message from General Catton thanking him for his outstanding display of airmanship. During a CH-3E functional check flight, Capt Pearson lost all tail rotor drive because of an intermediate gear box failure. Losing the tail rotor or its drive is one of the most hazardous emergencies encountered in helicopter flying.

The mission is not complete until you block in. If you remember this you'll avoid . . .

Navigator Error

by Lt Col Harold A. Barfknecht
MAC/ADL

This article, which appeared in THE MAC FLYER *several years ago, is just as important today as it was then. As it points out, navigators are a very vital part of an aircrew and have a tremendous amount of responsibility. In fact, in the last two years, two transports have crashed because of navigational error. Although the C-5 and C-141 have replaced the C-124 and C-135, the examples are still valid and apply to any flight in any aircraft.*

* * *

To the pilot, a navigator is the guy in the back who always has a wind shift just before the drop zone or destination. To the engineer, a navigator is the fellow who constantly needs fuel figures. To the loadmaster, he is the one who knows the burnoff fuel and time en route. The navigator often thinks of himself as being the crew's male secretary.

Actually, the navigator is a vital factor in flying safety. Because he advises the man who holds the controls, he has an excellent opportunity to save aircraft and lives. When he fails to rise to the occasion, disaster can result. To illustrate, I'll show you a few examples from MAC's past — examples of what I call "navigator error."

Departure

A few years ago a C-124 refueled at an en route stop and then took off at night in marginal weather. Climbout was straight ahead over rising tree-covered terrain. After a minute and a half of IFR flight, the aircraft crashed into a hill 200 feet above the field elevation. The cause given was "pilot error" because the pilot did not maintain a safe track-out course. Then too, he attempted the departure into rising terrain when he could have had an over-water climbout in a calm wind.

Navigator error? Possibly. A navigator should know about hills off the end of a runway. Surface winds may be calm, but 100 feet higher, a tailwind can flatten your climb angle. The navigator should have reminded the pilot of this crucial fact. One dissenting opinion on the direction of takeoff could have caused a "rethink" of the situation. If the opinion is needed and not voiced for "don't rock the boat" reasons, the navigator has failed in his duties to the crew.

Let's examine another departure, a C-135A departing at night with weather of 500 feet scattered, 900 feet broken, and three miles visibility. The pilot tried to expedite the departure by taking off with a two- to four-knot tailwind. The aircraft smashed into mountains four miles from the field. A terrain briefing had not been requested and there was no evidence of terrain clearance flight planning. The air traffic control (ATC) clearance delivered to the pilot before departure read "turn within two nautical miles." Pilot factor was listed as the cause of this accident. A navigator's predeparture dissenting vote could have changed this tragic story. The navigator must monitor the ATC clearance, the departure flight, and the radar scope. In the absence of an operating radar, a navigator can use DR to follow a departure. If he fails in his vital role, the result can be disastrous.

Still another departure accident involved a C-124. After takeoff, the pilot reduced power to meto and retracted the flaps. Suddenly there

was a severe vibration in the control column. A local procedure required all turns to the right when departing that particular runway, but in the excitement of the control problem emergency, the pilot turned left and the aircraft crashed into a mountain. The crew lived to meet the accident board, but the aircraft and cargo are still up on the mountain.

When that aircraft began to bank, there was still time for the navigator to announce on call position, "right turn only!" A navigator who does not monitor the departure is in no position to check on the man who holds the flight controls. If he does not check on departure procedures he has invited navigator error.

Cruise

Not all occasions for navigator error happen during the departure phase of a flight. The navigator has an equally important role during the cruise or en route phase. A classic example is the case of a WB-47.

A WB-47 was returning to the ZI after a weather reconnaissance deployment overseas. Navigation was by radar during the first portion of the flight to an island base. The N-1 compass began to precess after the WB-47 flew out of radar range. Later the aircraft ran out of fuel and landed 1700 feet short of the runway. The accident board called it pilot error, coupled with a series of gross navigational errors. In other words, the navigator was lost. He had simply failed to cross check the many navigational aids available and relied too heavily upon a single aid. The pilot was blamed because, ultimately, he crashed the aircraft.

Consider the fate of a C-124 transiting some mountains. In level flight and at cruise speed, the C-124 flew into an area of near-vertical cliffs. The plane was totally demolished and the crew perished. The accident board ruled pilot error because the crew planned and then flew four thousand feet below the minimum en route altitude! They crashed 24 miles south of their intended course only 110 miles from departure. Here again a dissenting vote was needed. A navigator must be conscious of the minimum safe en route altitude. When a pilot makes an incorrect decision, it is time to speak up. You may not get another chance. When radar is available, it should be monitored. Even DR aided by VOR radials and DME distances will help.

The following case is equally tragic. A C-124 on a routine night overseas cargo mission reported passing a certain radio beacon forty miles from destination. It was then cleared to descend for an approach. The aircraft crashed into a mountain 72 miles short of destination. The VOR receiver was inoperative — the ADF was tuned 10 kilocycles off the desired frequency. There were low clouds in the area. The time of the crash was the flight plan ETA for destination. Here again, the cause was listed as pilot factor. The pilot started his descent from en route altitude without an accurate knowledge of his position. What information *was not provided* to the pilot by the navigator? He had a radar set with which to monitor the flight. He had a radio altimeter to check the landfall time. He had an ADF to cross check the flight progress. Was one shaky station passage to determine the life or death of this crew? It evidently did.

Approach

The final examples of navigator error concern the approach and landing phase of a flight. If you have seen a navigator fold up his charts and head for the bunk after reaching the "100 out" fix, or if you have noticed a navigator rest his head on his desk during descent, you have witnessed the fostering of navigator error. The next case demonstrates why monitoring the approach and landing is necessary.

The C-121 was on a night VFR approach to an island base. The pilot cancelled his IFR clearance and continued his letdown on the VOR facility. Three and one-half miles from the field the plane crashed at the VOR site which was on a hill 300 feet higher than the runway. The cause was listed as pilot factor because the pilot flew below published minimum altitude on the approach. The navigator can scrutinize terrain clearance throughout the approach. His altimeter should be set to the local altimeter setting, and he should monitor the radar and radio altimeter. He should have a small scale chart of the destination area. If he does less than that, the navigator is not doing his job as completely as he should.

An RB-57 pilot on the downwind leg of a traffic pattern was asked to extend his approach. He made a 360 degree turn, reentered the pattern, and landed gear up. Again the cause was pilot factor. Due to distractions, the pilot forgot to lower and check the landing gear. His navigator could have prevented this accident by saying two words at the *right time*. Had he simply said "landing gear" this story would have had a different ending.

In the next case the navigator error is more tragic. The aircraft commander of a C-118 air aborted due to HF transmitter trouble. On the approach he tried to maintain VFR under IFR conditions. His "I know this area like the back of my hand" attitude resulted in a case of mistaken identity of terrain and radio towers. The C-118 ended up as a pile of junk on a mountain top and the crew of nine plus 57 passengers were all killed. Had the navigator monitored the radar, had he checked the VOR, or the ADF or the *compass*, this terrible accident would have been avoided. What was the navigator doing when he should have been guiding the pilot? He was committing navigator error.

Sometimes the little things sneak up on you. When they do, they can ruin your view of . . .

The Big Picture

by Maj Charlie Brown, 438 MAWg/SEF

The C-141 was only an hour out of East Coast AFB. The 0200 local weather was five hundred overcast, two miles in fog, with the winds light and variable. The pilot's briefing was professional and thorough, and the fact the crew was tired and at the end of a long duty day was not readily evident. Everything was copacetic. The pilot lowered the nose of the big aircraft and eased the throttles back to begin his en route descent.

This particular C-141 was a lead-the-force bird, with seven years of line experience. Several noteworthy items were reflected in its forms. There were also several discrepancies waiting to be cleared that were important, but not considered severe. But there was one discrepancy not listed — it *was* severe enough to ground the aircraft. A tiny crack, barely visible to the naked eye, had formed in one of the flap brackets that mounted the left inboard flap to the aircraft. A tiny crack — how can it be important? Perhaps we can find out. Let's leave the aircraft for a minute as it enters the radar pattern.

* * *

We're looking out over the parking ramp at a European air base. It's the same base our C-141 left several hours ago. The departure was barely on time. Two colonels on the

ramp are talking. One is in charge of operations, the other is in charge of maintenance. Let's listen:

"Only two delays this week, Fred. That oughta make the Old Man happy, eh?"

"Yeah, I hope so. Maintenance is always catching it in the ear. We just don't have the manpower to support all the extra workload that keeps coming in. And I have to let my people have a little time off. Everybody keeps talking about quality maintenance. I'd be glad to provide quality maintenance if I could! Give me some experienced people instead of 3-levels! Give me a little time to work on aircraft instead of push, push, push to meet some operational commitment! Get everybody off my back. Geeez, it was just like this at East Coast AFB," complained Fred.

"Guess it's out of the frying pan into the fire, huh, Fred? And you thought you were coming to Europe for a vacation."

"Al, I don't expect a vacation. Things are the same every place. I can't tell you how glad I'll be to retire next year! If my ulcers don't kill me first!" he concluded.

"Don't feel like the Lone Ranger, Fred. The pressures on ops are just as great. I came here from West Coast AFB, and the situation there was the same. Push, push, and don't you dare have a delay chargeable to ops. Wind those crews up tight and keep those aircraft moving. Sorties, tons, reliability, flying time. I understand the whys; I know the hows. I may even have a shot at a promotion. But I wonder if it's all worth it? Maybe it would be easier if . . . aw, I don't know. What difference does it make so long as we get the job done?

* * *

Let's move over a few hundred yards to a maintenance line shack. Inside are several maintenance troops. A senior sergeant has just given two young airmen their work assignment and is walking out to go to chow. The airmen are talking.

"You know, I'm beginning to see C-141s in my sleep!"

"I know the feeling, baby. This shift work is getting to me, too. Always the same thing. Either ole Zebra Arm, one of them prima donna flight crews, or some colonel is on my back *all* the time! Hurry here, hurry there! Fix this and fix that! They must think I'm some kind of dang genius!" insisted the second troop.

The first airman continued the conversation, "Well, I really like working on airplanes. I like to fix them. But they rush you so much you can't take time to put any pride in your work. And sometimes I don't always know what to do. Ever notice how hard it is to get one of the *big* sergeants out of his truck when the weather is bad?"

"You bet, baby! Just the other day they had me pull an inspection on the flap area of a '141. Back in this tiny place I found a little crack in the flap bracket and it took me two hours to get someone out there to look at it and confirm what I'd found. We canned a bracket from another bird and got ours on the way."

"That happen often? The flap bracket problem, I mean?" the first airman questioned.

"I don't know. That was the first one I'd seen. Wasn't even sure it was a crack. Just looked like a little dark line right under where the metal curved around." He drew a curve in the air with his hand as he spoke.

"That's funny. On my last shift I was pulling an inspection and thought I saw a mark on one of those. It was dark though and everyone was in a hurry to go, so I didn't say anything. Suppose it makes any difference?"

"Dunno. Guess not."

* * *

Our next stop is on the ground floor of the wing headquarters building. The flying safety officer is on the phone talking to the NCOIC of the Quality Control Shop in the maintenance complex.

"Sergeant Johnson, what can you tell me about the cracked flap bracket you found on 070?"

"Well, captain, I just found out about it this morning. A hairline crack in the radius of the inboard bracket, left wing. We canned one off the '141 that's down for a block tire change and put the part on order."

"What happened to the old part?" asked the captain.

"Well, sir, it was turned in to normal supply channels, I guess. I haven't been able to find it."

" The old 'fair wear and tear' trick, eh?"

"Looks like it, sir. We can't seem to catch 'em all."

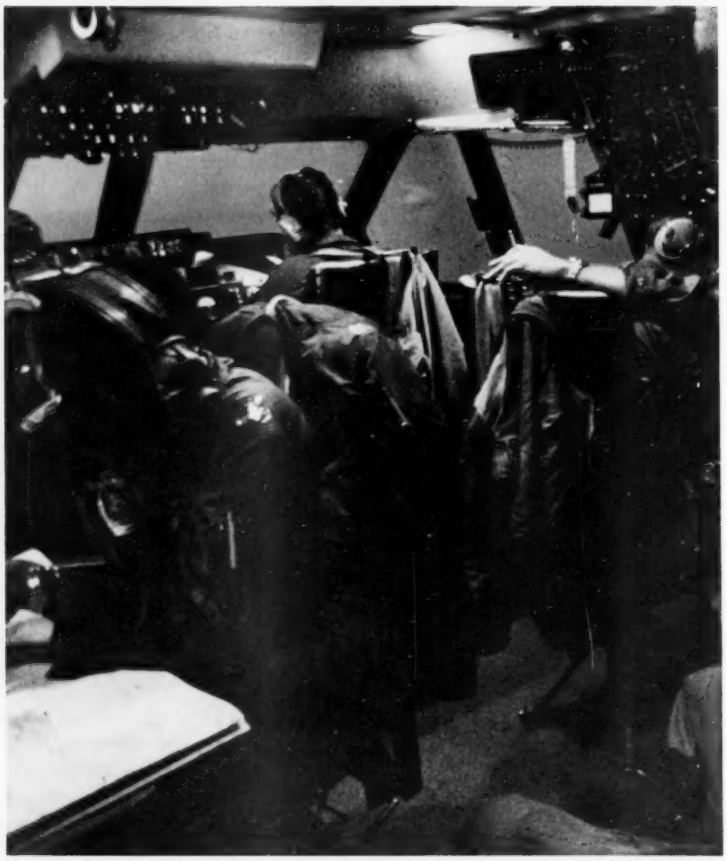
"We sure could have used that for an EUMR exhibit," insisted the captain. "I guess you won't submit a EUMR without an exhibit will you?" he asked hopefully.

"No sir."

"OK, sarge. Thanks. Talk to you later." As he hung up the phone, the safety officer looked at the incident report message on his desk. It described a cracked flap bracket that had been found on a lead-the-force bird in the Pacific. It was the only other one he had heard of.

May be a trend, he thought; wonder what would happen if this failed in flight, close to the ground? Sure wish I had time to follow this up properly instead of feeding this paperwork monster someone has

Honorable Mention Winner 1972 Writing Contest



created out of the safety business. It would be nice to be able to do a little preventive work instead of spending all my time stomping out brush fires. I get the scary feeling we're swatting at flies while the tigers are about to bite us on the behind.

The captain's thoughts are interrupted with the rude ringing of the telephone, and that's where we'll leave him.

* * *

Let's go upstairs in the same building and visit the wing commander's office. As usual, he's very busy. We won't bother him, we'll just quietly look over his shoulder at the paperwork on his desk. We'll thumb through his appointment calendar, too, and get an idea of his schedule.

There's a file marked "Commander's Call"; one for an awards program; here's a briefing package for the VIPs who are due in later this week. His calendar calls for a daily staff meeting, ops and maintenance briefings, and a certification board for two new attached crewmembers in his mission support program. At lunch time he must speak to the Officers' Wives Club about the base beautification program, and tomorrow night there is a staff cocktail party. A little further in the future are meetings and conferences on the race problems in his command, community relations, and safety. The list goes on and on. The commander *is* a busy man. That's why he has a staff. To serve as his eyes and ears. To feed him information and recommendations that will allow him to make sound decisions. Obviously, this commander cares. Unfortunately, he cannot care about what he does not know about. And he does not know an aircraft departed his station with a potentially deadly condition existing in the flap well.

The commander knows the pressures that face his operations and maintenance people. He was once a colonel in the same situation. The pressures are passed down to his staff because the commander is under the same pressures, plus many others. Perhaps if the staff were willing to air a few more of their problems to the Old Man, he could shift the emphasis and relieve some of the pressures. A good staff, working for a good commander, can do this without fear of being considered weak or unable to accomplish their task. This commander is a good man and a hard worker. He deserves top staff performance but doesn't always allow it, or demand it. Is that important? Let's go back to our aircraft and find out.

* * *

The weather at East Coast AFB is now down to 300 feet and a half mile and closing in rapidly. The pilot, with the aid of the radar controller, is expediting his approach. The Starlifter is at the outer marker and has intercepted the glide path. The spoilers have just been retracted

and the aircraft is clean. Things are busy in the cockpit.

"Gear down, Before Landing Checklist," the pilot commands. He pulls the throttles to idle and watches the airspeed hang a knot above max gear extension speed. The copilot notices, too, but neither of them figures the extra knot will hurt. It doesn't. The aircraft starts its final descent.

"Flaps full," the pilot says, pushing the nose forward a bit to catch the glide slope indication on his ILS.

"Airspeed," the copilot calls, noting they are almost 15 knots above max flap extension speed.

"No sweat," the pilot answers, "by the time they get to the full down position the speed will have bled off to the allowable point. Keep an eye on them and stop them if it's not."

"Okay," the cojock replies. And he watches — until a radio call distracts him. That was about when it happened, although it will take the accident investigation board several weeks to reach this conclusion.

The flaps almost reached full extension when the left inboard bracket, the one with the crack in it, failed. The airload on the big flap was too much on the remaining brackets, and they too, failed. The flap asymmetry system, noting the uneven movement before the crew did, locked the flaps in position, but the inboard flap, now free, attempted to swing to the trail position. It moved with such a violent force that it went past the "up" position, jammed there amidst torn metal, and became a large and effective spoiler. The aircraft began a roll to the left.

Perhaps the pilot could have made it if he had had more time, more altitude, or perhaps even more experience. Daylight would have helped, had he had the other items he needed. As it was he almost made it. He got the power in and was fighting the full flap go-around all the way, without really knowing what was happening to him. The left wingtip dragged through some trees off the left side of the runway and the aircraft started to cartwheel. Then the left wing separated and the remainder of the aircraft impacted inverted. There were no survivors.

* * *

Let's leave the uncomfortable scene of the smoking hole in the ground and return to reality. Sure, the story was just that . . . a story. But similar things have happened before. And unless we start working together towards the same goals, they may happen again. The trouble is we often have a hard time seeing the forest for the trees. Like the folks in the story, no one can be blamed directly. It was the composite of a lot of little things that piled up to kill our fictitious aircrew.

It's easy to get wrapped up in our own problems and concerns. But just because someone has a different AFSC doesn't mean he's not in the same Air Force with you. This story was an attempt at communication. Have you "communicated" with anyone today? If you haven't seen a little of yourself in this story, perhaps you've lost sight of the big picture. If you don't recognize a bit of the problem, you just might be a part of it. Let's all try to keep the little things from sneaking up on us. Surprises in aircraft aren't fun.

Are You a Good

WHAT MAKES A GOOD COPILOT? If *you* are a copilot, you should be asking yourself this question. If you're an AC, you should have asked yourself this question when you were upgrading. And now that you are an AC, you should be grooming your copilots for upgrading. We've got some interesting answers to this question and hope they might aid upgrade-minded copilots.

The AC, of course, gets the credit or the blame for anything that happens to his aircraft, crew, or mission. His name is on the top of the flight orders and the bottom of the clearance. If he tells his copilot to go to blazes (AFB) guess who had better start filing a flight plan? But what about the man on the right? Could there be any virtue in trying harder because you're only number two? If you're a copilot planning on making that big move to the left seat, there definitely is!

A good copilot does considerably more than work the gear and the flaps and operate the radios. His duties start long before the engines do, and how he accomplishes them has a direct bearing on the ease or difficulty of the mission.

A sharp copilot will help coordinate the predeparture duties. Before he reports to the aircraft he should know such things as the flight plan required fuel load so he can ensure the aircraft has been properly fueled. If he's at an en route stop, he should know what fuel load is required. He will know whether fleet service has been ordered and make sure it gets to the aircraft. If fleet is late, he'll get on the radio and let someone know before there's a delay. He will check the cargo for security (or availability) and keep tabs on any problems the loadmaster may be having. As the crew equipment officer, the copilot should also make a conscientious check of the 780 equipment. Not only might he be charged for something that's missing, but knowing what's aboard and exactly where it is could be very handy in case of fire or ditching.

The copilot's preflight should be above reproach. It should even include putting out the FLIPs for the pilot and himself and setting up the radios and instruments for departure.

When the rest of the crew arrives at the aircraft, the copilot should be the world's greatest living authority on their predeparture status.

A sharp copilot will have his radio procedures down pat and coordinate the checklists with a minimum of fuss. He will know what he wants to say, and say it. He knows better than to interfere with the crew briefing by calling the tower for the clearance when the AC pauses to take a breath. If the tower calls with the clearance in the middle of a checklist, the copilot shouldn't have to wait for the AC to tell him "Stand by one."

The copilot ought to be about the best clearance reader in the world. With the 175 in front of him he should be able to copy the most complicated clearance, error-free, and read it back the same way. If he's AC material he will understand it, too! Further, he knows which radio calls are mandatory and doesn't sit on his thumbs till the AC says, "Call for taxi clearance," or "Tell them we're ready for takeoff."

A good copilot will take the initiative. He'll be aggressive about his duties and have a positive attitude. Most important, he'll know what's going on. Any AC should make mental allowances for a green lad on his first couple of trips, but once past those early days, Joe

Copilot ?

Copilot should try to be at least one step ahead of what's happening. (We had one AC tell us that if he crashed his copilot wouldn't hit the ground for at least an hour! He was *that* far behind the mission!)

Once airborne, the copilot shouldn't be too impressed with his own agility on the gear and flap handles, since they constitute only a minor part of his duties. The man on the right should always (with apologies to the Navigator's Union) know where he is, where he's been, and where the next check point is. He should have a finger on the fuel state and the mechanical condition of the aircraft. He should be planning ahead to the approach and landing, even if he won't be doing the actual flying. He must constantly be ready to take over and complete the flight, should anything happen to the AC. He must always keep his own importance in mind. Why else would the designers have put two seats up front?

The best advice for an aspiring copilot is that every time the AC makes a decision, large or small, the copilot should make a decision as to how *he* would do it. (Unless asked, however, a smart copilot will keep these decisions to himself.) By comparing his "decisions" against the AC's, he'll gain more experience in preparation for the day when he can move to the left seat. We know of no better way to prepare for command than by getting in the habit of constantly making these decisions. Try it on your next trip.

Another important airborne point: While the AC flies the aircraft, the copilot should fly it in his mind. Anticipate which way the AC will turn to enter the holding pattern or execute the procedure turn. If something doesn't look right, challenge the AC! Don't be blinded by a rank difference. Even if you are a second lieutenant and he's your full bull CO, one mistake can kill you both! A clever copilot will ask a subtle question such as, "Do we turn right to enter this pattern?" as a reminder to the AC. If Joe Copilot lets his AC get violated for improper maneuvering he's guaranteed an uphappy cockpit companion. More than one aircraft has been saved because an on-the-ball copilot caught the AC in a mistake *before* it was too late.

A good copilot doesn't stop with just monitoring the flying. He takes mental notes of all the activities that make for successful completion of a mission. He makes an effort to get along with the rest of the crew, and lightens their load instead of being a chronic complainer. He is interested in all the aspects of his job, the operation, and the machinery that makes it work. He understands and appreciates the work done by his fellow crewmembers. He knows his aircraft inside and out, and he uses the time allotted in the right seat as it was meant to be used — in preparation for upgrade. If a copilot uses this time properly, chances are he'll be a better than average aircraft commander, too.

So how do you measure up? Do you, Mr. Copilot, take advantage of every opportunity to learn and gain experience in your profession? When the AC lets you land, do you pay attention to what he has to say after the landing? Could *you*, right now, leap into the left seat and launch on a mission as the man-in-charge? If you could, fine.

If you have your doubts, maybe now's the time to drop back and regroup or take a look at your progression before some one does it for you!

Remember, start thinking like an aircraft commander! With ability, training, and the proper attitude, you may soon find yourself responsible for several lives and a multi-million dollar aircraft.

C.R. TERROR

This month the Aerial Ace cheats death by recovering from a self-inflicted flight control problem.

M'DEAR, you just must sample this Madeira. I imported it from sunny Portugal just last week and it's full of warmth and laughter. '57 was a vintage year, y'know."

The curvy young blonde obediently raised the delicate glass to her full, soft young lips. Her adoring eyes looked into C. R.'s over the top of the glass. Her left hand continued to caress his satiny pate while her left knee pressed insistently against his right thigh.

C. R. was on cloud nine. His lovely partner this evening was none other than Wanda Wiggins, Miss Juniper Blossom of 1971 and now a 2d Lt dietitian at the base hospital. His mustache wax had actually melted the first time he laid his bloodshot eyes on her physical loveliness. She was the most beautiful woman he had ever seen, and he was shocked beyond belief when she actually accepted his invitation to a night on the town.

"I've had a divine time, lover," she breathed in his pudgy little ear. Slowly, luxuriously, she stretched with feline grace. C. R. couldn't take his eyes off her as the motion did fantastic things to her figure. Pout-ingly, she added, "and it's *such* a long, long way home. I could just stay here all night; it's so comfy."

C. R.'s head, already slightly the worse for wear after the long evening of Terror-tinis, stage show, late supper for two followed by liquors, flambé, etc., fairly throbbed with ill-concealed excitement. His short arm slipped around Wanda's intoxicat-ingly scented shoulders and pressed her close to him. She raised her lovely lips expectantly . . .

RRRRRIIIIINNNNNGGGG.
BBBRRRIIINNNGG.

Desperately C. R. fought to hang on to the exquisite moment, but it was no use. He awoke, as usual, in a BOQ room. His flailing paw knocked the alarm clock off the night table onto the floor. It landed face up, indicating the unlovely hour of 0300.

He sat up and scratched his belly. For a moment or two, he couldn't remember where he was. Hickam? Wake? Clark? They all seemed such a blur these days. Besides, he never

saw them in the daytime. Every time he put his Starlifter's gear down, the sun was just coming up. Or it seemed so anyway.

Suddenly the tiny room, littered with sweat-stained flight clothing and smelling like a rarely cleaned gymnasium, was bathed in the harsh glare from the single naked light bulb in the ceiling. Long Suffering Sam stood by the switch, vacantly staring at C. R.

"Is it alert time already?"

"I guess so," mumbled the World's Sleepiest. "What day is it?"

"I dunno. Lost track 'bout the middle of last month. Come to think of it, I'm not real sure what month it is!"

Slowly, like humanoid robots, the two pilots moved through the oft repeated ritual of shower, shave, shine, etc. In the adjoining room, Blinky, Magellan's understudy, could be heard doing the same.

Halfway to their aircraft it started to rain. The crew bus driver dumped them at the crew entrance hatch, then immediately sped off, leaving them to complete a baggage drill and preflight inspection in the predawn wetness.

C. R., his normal bubbling self-confidence fast disappearing, made a brave but futile attempt to make the best of the situation. "C'mon, me hearties. Let us away to yon eatery and partake of a luscious repast, lest we aviate with our blood sugar at a dangerously low level!"

Blinky and Sam just grunted, but fell in with their leader as he began the long walk across the ramp to the snack bar next to the ACP. Sgt Torque, already soaking wet, was a bit more vocal. "Luscious repast, my left clavicle!" he snorted. "None of us have had anything but hen fruit for a week and that's all we're gonna get now, too. Can't understand why we all haven't grown tail feathers!"

* * *

In ACP, the young captain controller assured them that everything was all set for their flight to Saigon. "Traffic had to pull your original load and put it on another aircraft. They've been running a little behind down there, but should have your new load in place in an hour."

"What have we got this time?" queried C. R. Not that it made any particular difference.

"Dangerous cargo, ammo for the Army, I think. You'll be briefed at the aircraft."

C. R. shrugged. Ammo, schrammo, he thought. Who cares? Another trip, another load, another fitful crew rest then start all over again. Like zombies he and his crew continued their trancelike pace into the flight planning room and began the predeparture routine.

Later, after checking with weather and finding the forecast to be stinking at both ends with scattered thunderstorms en route, they took their clearance back to ACP.

"Oh," said the captain who appeared genuinely sorry, "I'm afraid you're going to have another slight delay." C. R., Sam and Blinky just stared back at him. They were beyond feeling. "Maintenance control says you have a flat tire and they will have to offload part of your cargo so they can change it. ETIC is 0800 local, three hours from now."

* * *

At the aircraft, Sgt Torque sat on a chock chewing the unlit stub of a sodden cigar and stared glumly at the left wheel well. There was no one else in sight. A maintenance truck had come by several times in the past couple of hours and once had left two men with tool boxes. After a cursory inspection of the flat tire, however, these two had mumbled something about a shift change and hopped a passing pickup back to the shop. Another time a ramp coordinator had stopped briefly, inquired what the trouble was, nodded sagely, barked some commands into his mike, then left.

Sgt Torque looked at his watch: 0756. He didn't think they'd quite make that 0800 ETIC.

* * *

At exactly 1517:45 hours, local time, the Gross Gripper of Go Levers wheeled his C-141 into position for takeoff, crammed the throttles forward, and called "Max power, Sammy Boy. Let's get airborne!"

In their haste (they'd been briefed that ammo was desperately needed in Vietnam) and their relief at actually getting under way, no one noticed that number one hatch was lying on the top crew bunk. Because of the numerous delays someone had removed the hatch, and it was never replaced.

"Go!" Sam called as the airspeed reached decision speed. There was a strange noise in the cockpit as the Starlifter broke ground. Finally the Aerial Ace noticed the loud noise.

"Crew, this is the pilot. Does anyone hear a loud buffeting noise?" The scanner was the first one to respond.

"Yessir, it's your copies of *Penthouse* and *Playboy* being sucked out number one escape hatch!"

"What!" screamed the Pudgy Pilot as he flicked the autopilot on and turned in his seat to check for himself.

"Torque, how come the hatch is lying on the top bunk?" barked the Fat One.

* * *

They quickly decided to slow the aircraft to approach speed, tie a tie-down strap to the hatch, and attempt to install the hatch in flight. The last thing C. R. wanted to do was to go back in and land. He didn't want to eat humble pie; it had already taken too long to get off, and he wasn't about to go back and have to start all over again.

All of a sudden there was an awful noise and the plane started yawing and pitching. Then everything settled down and there was just the loud noise of the open hatch and moderate buffeting of the yoke.

"Whatthehellshappeningbackthere?" screamed the Rotund One, hoping everyone could hear him over the roar. There was just silence and then finally Sgt Downs, the loadmaster of renown, spoke.

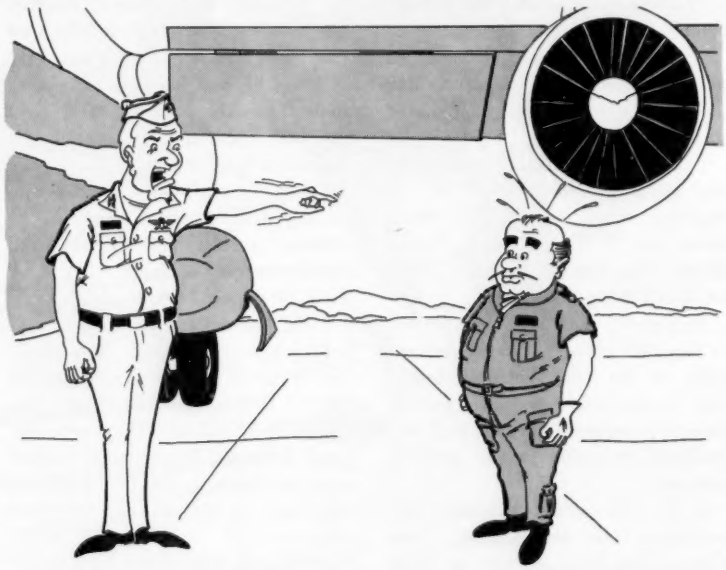
"Sir, the tie-down strap slipped out of our hands and the hatch went overboard."

"Overboard!" cried C. R. "You mean we have a dropped object!" C. R. directed Sammy to get radar vectors back to Clark and to tell them and ACP that a hatch blew out and it was causing minor flight control problems. "We'll report it as a dropped object," instructed C. R. and then he quickly briefed the crew to say nothing about the missed checklist item and the attempts to put the hatch in in flight. Since they were already at a low airspeed and the aircraft was handling well, C. R. did not perform a controllability check even though Long Suffering Sam tried to talk him into one. As they slowed to final approach speed the buffeting became more severe, and as C. R. flared to land, the giant Starlifter rolled to the left.

"Yoweeeee!" shouted the Aerial Ace as he fought to regain control of the plane. It seemed like hours but it was just a fraction of a second and they touched down. Max brakes and reverse brought the aircraft to a grinding halt. The tower rang the crash net because of the gyrations on final approach so the aircraft was immediately surrounded by the entire base fire department, base commander, and the support group commander. C. R., being his cheerful self, told Sammy to clean up the cockpit and then bounded out to greet the reception committee. To his surprise, he found only one maintenance man by the crew entrance door. Everyone else was gathered around the tail of the aircraft. The Prince of Pilotage sauntered back and addressed what appeared to be the leader of the group.

"Hello colonel, I'm Major Terror, the Alpha Charlie of this kerosene converter. I . . ." The colonel cut the Pudgy Pilot short.

"Major Terror, I thought you called in that the escape hatch blew out and that you had a dropped object. That hatch is a plug type and it can't blow out. It looks to me like you had better change your story a little." C. R. was a little confused, but then he glanced up as a cherry picker moved into place and a maintenance man began unwinding the tie-down strap, with the hatch still attached, from the vertical stabilizer. The colonel continued.



"Terror, you bumbling idiot. You took off with the hatch out and tried to put it in in flight, didn't you? Do you realize just what could have happened by pulling this stunt? One of your crewmembers could have lost a finger or a hand trying to get the hatch in. By hooking a tie-down strap to it, you jeopardized the safety of the aircraft and crew. Look at the damage it's done to the airframe. The entire top of the fuselage is banged up and the vertical stabilizer will have to be replaced. It's a wonder with the hatch trailing from the tail, you even made it. You almost lost the aircraft on final. You could have air aborted, replaced the hatch, and then taken off again and none of this would have happened. Your squadron commander is going to get a full report of this caper. I am deadheading you back home. You're a menace to the system." The colonel fumed, stamped, and stuttered, and finally ended his tirade by saying, "Do you have anything intelligent to say for yourself, major?"

C. R. squirmed, and his waxed mustache drooped a little from the afternoon heat. He took a deep breath and regained a little bit of his composure and confidence and looked the colonel straight in the eye saying, "You know it's easy for you guys in maintenance and operations to cover your tracks and make sure you don't get charged for a delay. The aircrews beat the ramp and push push push to help you, but the minute we blow something you're ready to hang us."

The Magnificent Man puffed his chest a little, saluted the colonel, and then turned to gather his crew and take them back to the rain-soaked trailers.

Safest Crewmembers

Remember an article entitled "Why Married Men Are the Safest Crewmembers," which appeared in our July issue? We presented this feature as a humorous treatment of a continuing problem. Admittedly it was one-sided, but that alone is not necessarily a fault.

We can hardly say we were surprised to find that people eagerly took sides in the argument. However, we were amazed at the rapid and pithy response. Shortly after that issue was released, two letters crossed the editor's desk. May we present:

A Bachelor

Dear Editor,

I read the article on why married men are safer in the July 1972 issue of your Flying Fishwrapper with shock . . . how could you print anything so *wrong ! ! !*

Bachelors are far safer pilots than the married types. The reasons are clear and simple: A bachelor must constantly plan ahead for any contingency and he must be quick-thinking enough when an unforeseen development arises. Anyone knows that these are the most important assets to the safe pilot.

When it comes to planning, for example, can you imagine what an unsafe thing it would be if a bachelor didn't plan, got trapped and then had to cinch an oxygen mask tight to face freshly shaved with a leg razor?

And for quick thinking, who but a bachelor would be able to come up with a plausible answer when his date asks who the other five toothbrushes in the medicine cabinet belong to?

Finally, the positive proof that he plans and thinks quickly is the fact that the bachelor is a *bachelor!*

Walt
Indignant Bachelor

A Wife

Dear Editor,

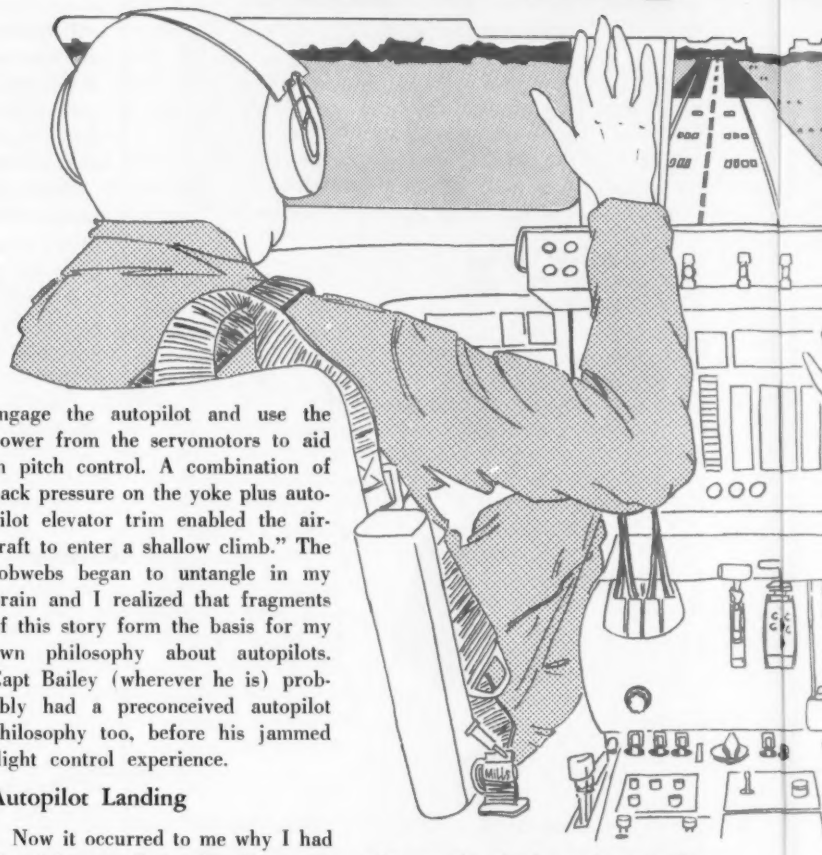
I have just read over my husband's shoulder your article on how married men make the best pilots, and I just couldn't agree more. You should see the extra time and work my husband puts into being a good pilot! Would you believe he regularly spends an extra couple of hours at the office every Friday evening studying his Dash One and writing up flight reports or whatever they write? And he is so tired when he gets home he can hardly walk and doesn't even have any appetite for the nourishing dinner, kidney stew for instance, that I prepared for him. And last weekend when I planned for him to paint the kitchen, that poor man was so conscientious he spent the entire day instead, running around the track to keep in shape for flying. And then naturally on Sunday he had to rest up from Saturday so he would be a good pilot on Monday. And all without one word of complaint.

When I read about the way those bachelors live it up, I feel sorry for them. Don't they ever stop to think what good pilots they could be, too, if they had a good woman to come home to, nourishing meals waiting for them, and the chance to do creative things like painting the kitchen?

Betty
A Female Fan

One man's opinion on the use of autopilots:

That's Why I L



ENGINEER, feather number three propeller. Go around. Max power. Engineer! Max power!" commanded the pilot.

"Max power, ADI on," answered the engineer.

"Copilot. . . . Help me pull back on the yoke!

"Scanner, help us pull harder," pleaded the pilot.

"Oh God get the autopilot on . . . switch on . . . engage handles.

"Ahh"

"Wake up. Sir, wake up. You're having a nightmare," the copilot said as he shook me.

"Okay, okay, I'm all right now," I said as I swung both feet to the floor, stood up, and walked to the bathroom.

I splashed my face with cold water, went to the refrigerator, poured and drank a big glass of ice water, pulled on my pants, walked out the door into the warm Okinawa night, and found a car fender to sit on. I shook my head. What kind of brain fault had caused the short circuit that made me mentally relive a situation that had occurred to someone else more than nine years before? The pieces started to come into focus. Capt Joe A. Bailey and crew were cited with a "Good Show" in the November 1963 issue of THE MATS FLYER. The part of their experience that I was reliving in my dream goes like this: "Shortly after takeoff, Capt Bailey noticed a binding in the elevator controls. The aircraft reached 150 feet above the terrain, then began a slight descent even though considerable back pressure was applied to the yoke. From all indications something was interfering with the elevator torque tube movement, and the snubber unit was the logical offender. As the copilot, Maj Cahill, helped pull on the yoke, Capt Bailey actuated the emergency snubber release. This dumped the hydraulic pressure within the snubber units, thereby freeing the snubbers. However, this didn't help.

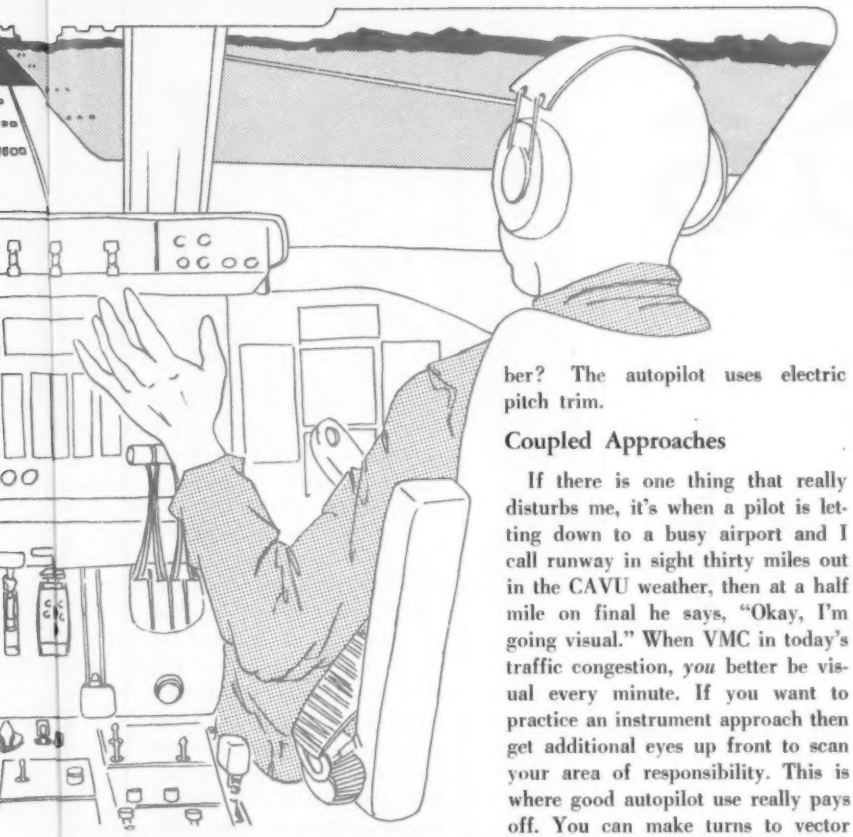
"Capt Bailey's next action was to engage the autopilot and use the power from the servomotors to aid in pitch control. A combination of back pressure on the yoke plus autopilot elevator trim enabled the aircraft to enter a shallow climb." The cobwebs began to untangle in my brain and I realized that fragments of this story form the basis for my own philosophy about autopilots. Capt Bailey (wherever he is) probably had a preconceived autopilot philosophy too, before his jammed flight control experience.

Autopilot Landing

Now it occurred to me why I had the nightmare. Just a few hours ago I had flown a surveillance approach to minimums and landed my C-141 on autopilot. Briefly this is what happened to me. On descent at about 265 knots the elevator artificial feel light came on. All efforts to recapture artificial feel failed. Around 5,000 feet, with gear down and flaps approach, I slowed to approach plus thirty knots to verify the control pressures that were going to be present during the approach and landing. The copilot and I played with the airplane a little and then I confided that, with these elevator forces, I was not going to be able to make a surveillance approach to minimums with cumulus clouds, moderate turbulence, and rain. This was going to be an autopilot approach and landing. I maneuvered with the turn knob, altitude hold, and pitch wheel. On downwind I changed to heading select mode, and at slow speeds it helped when I added a little rudder to speed the rate of turn. Because of the turbulence, I elected not to use auto-throttles but they would have worked great in smooth air. When the GCA controller told us to descend to minimums, I flicked off the altitude hold and rolled the pitch trim wheel two short turns nose down and looked for about a thousand feet per minute rate of descent.

by Maj Charles L. Pocock, MAC/IGYF

I Let George Do It



Flaps landing; I slowed to approach speed and made small heading corrections with the heading bug and rudder assist. The copilot and I both saw the runway just before minimums. Then I selected control wheel steering and Lat Off for landing. After touchdown, with spoilers deployed and the nose gear on the ground, I punched the autopilot off switch on the yoke.

This wasn't the first time I had landed with the autopilot. I have done it several times for different reasons. For example, it is very handy when number two hydraulic system failure leaves you without any electro-hydraulic pitch trim. Remember? The autopilot uses electric pitch trim.

Coupled Approaches

If there is one thing that really disturbs me, it's when a pilot is letting down to a busy airport and I call runway in sight thirty miles out in the CAVU weather, then at a half mile on final he says, "Okay, I'm going visual." When VMC in today's traffic congestion, *you* better be visual every minute. If you want to practice an instrument approach then get additional eyes up front to scan your area of responsibility. This is where good autopilot use really pays off. You can make turns to vector headings and maintain altitude and airspeed with only occasional glances inside the cockpit.

I'm a firm believer in AWLS approaches, but, if the airport ILS is not CAT II or the AWLS is misbehaving, good old autopilot coupled approaches are still great.

Emergency Use

Since the autopilot uses electrical inputs to move the control surface trim, the autopilot can be used as an emergency flight control system.

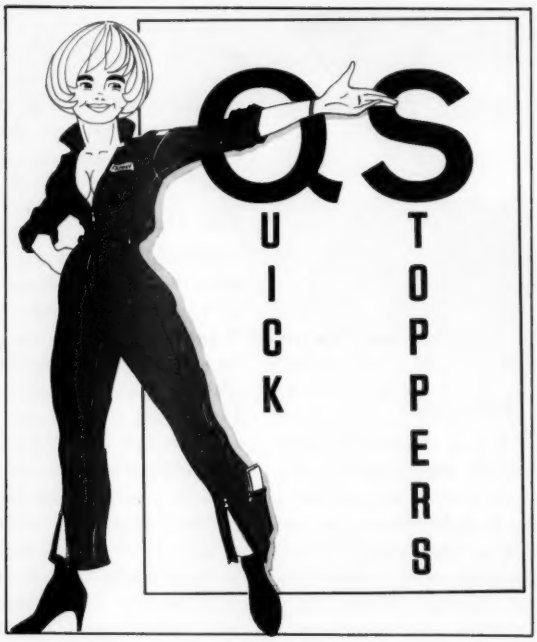
It can also be used to allow you more time to properly analyze other emergencies. Many times, while instructing, I have seen very capable pilots fail to properly accomplish an emergency procedure and fly the airplane while they solve the emergency. Since the autopilot uses gyro number three, it can also be used as a double check should either of the pilots' ADI gyros fail. Even if you lose C-12 compass number two, you can give the autopilot a heading reference by selecting DG on the compass controller and slaving the heading to the number one C-12 heading cross-checked with the standby compass.

Past History

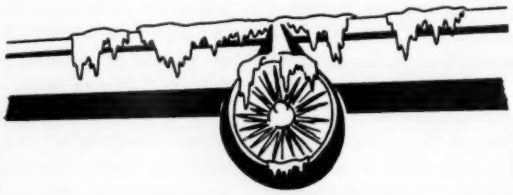
When the C-124 autopilot saved Capt Bailey's aircraft and crew, MM 55-1 contained a statement saying that no part of the autopilot would be on or engaged below 500 feet. This is probably still a good rule for C-124s, C-130s, and some other aircraft. But, autopilots designed for Cat II operation have led to the present guidance that maximum use of the autopilot is encouraged.

George, which is a term I haven't recently heard applied to the autopilot, is one of the best pilots we have. He is a superb instrument pilot who makes smooth turns with never varying bank angles. He can hold constant altitude and heading for hours on end. He can even hold near perfect airspeed. Not only is George a good pilot, he doesn't get per diem, he doesn't care if he gets in the zone, doesn't require crew rest, and doesn't snore. As a matter of fact he has very few vices. If any of his channels are not feeling too well, our crew duty day is reduced to twelve hours. George is great, rain or shine. If you ask me THE MAC FLYER ought to give *him* a "Good Show."

(Ed Note: We would like to start a recurring feature of personal experiences that MAC crewmembers have had. If you would like to share yours with our readers, please send them to us. Our address is inside the front cover.)



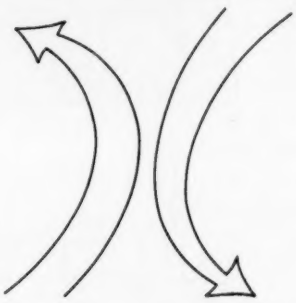
Winter's Near and Icing's Here



Would you believe we got a preview of our winter icing problems in June? It's true. We had a C-5 that could not continue its mission because of rime icing. Climbing out of Yokota the big bird accumulated so much so fast that the anti-icing systems could not handle it.

Winter is just around the corner and the icing problem is one that we all must deal with. Make sure the weather briefer covers the subject. Okay?

It's Happened Before

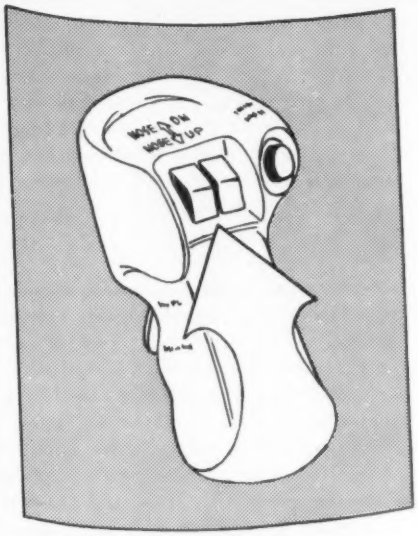


We've reported near miss incidents before, but here's a case where a mid-air or near miss was averted by listening to the radio.

A C-141 was assigned FL 230 by France Control. The crew heard another aircraft report in to France Control at FL 230 with an estimate for the next reporting point. The alert C-141 crew noted they both were planning on being at the same place at the same time at the same altitude. They didn't particularly look forward to the meeting so they contacted France Control and advised them of the forthcoming revolting meeting. France Control immediately had both aircraft ident and descended the C-141 to FL 210. The '141 crew then watched as the other aircraft passed just in front of them.

This hazard exists anywhere you fly. Earlier this year two commercial aircraft flying along the east coast were misidentified by a controller and a near miss resulted. See and be seen is very important, but listening saves lives too.

Trim Terror



The local training flight had progressed normally and the Starlifter crew was now shooting touch and go landings. As the instructor pilot positioned the flaps to takeoff and approach, the trim indicator increased from 6 to 8 degrees nose up. The IP quickly checked the pilot to see if he was trimming — he was not. They were on a short runway and the power was set for takeoff. Nose down trim did not work. The IP took control of the airplane and continued the takeoff disconnecting the trim and using the manual hydraulic lever. He then reset the trim and everything worked properly. The IP terminated the mission on the next landing, and maintenance found a malfunctioning flow control valve.

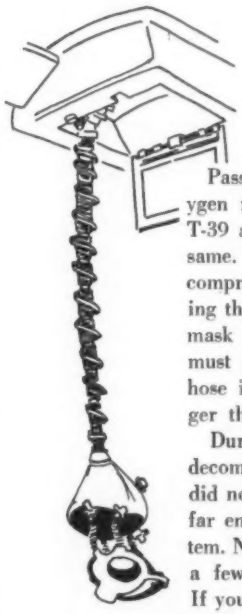
What's so great about this incident? Nothing really. The IP was just doing his job. But it's a reminder to all of us that the copilot's job is more than just a gear lever and radio knob controller. He's there for a purpose. His jobs are varied and critical to efficient mission accomplishment. So, whether you are an IP or a two-hour copilot, know your job and do it well.

Left Stiff

The left rudder on a WB-57 jammed when the weather bomber jock didn't do a thorough rear cockpit check before takeoff. Seems the crash axe was not properly secured and wedged itself between the right rear rudder pedal and right side of the rear cockpit. But the WB jock didn't do all bad. His astute airmanship got the bird back on the ground all right.

But how about it? Aren't we all a little sloppy in the cockpit? Pencils, flashlights, approach charts, you name it, can mysteriously slip to the floor. Do you immediately recover them or account for them? Big airplanes as well as little ones are susceptible to flight control jamming. Do a thorough preflight and don't be a litter bug.

Pull It All the Way Out



Passenger compartment oxygen masks on C-5, C-9, and T-39 all operate essentially the same. If you have a rapid decompression, the door concealing the mask will open and the mask will fall out. *But*, you must pull the mask until the hose is fully extended to trigger the oxygen flow.

During a recent C-5 rapid decompression, several people did not pull the mask and hose far enough to activate the system. Needless to say this caused a few disconcerting moments. If you ride on one of these aircraft and you are required to use the oxygen mask—remember: pull it all the way out!

(Note: see p. 31.)

A *Little Litter Hurts*

Okay you guys, we've gotta tighten up — bolts, panels, caps, etc. — anything that can fall off an airplane. Dropped objects are on the rise and MAC aircraft seem to be the biggest contributors. Maintenance men — you're gonna hav'ta make better inspections of all your work performed on the aircraft. Flight crews—you guys are gonna hav'ta make sure you do an extra good preflight. If we all work together, we can lick this problem. As a little incentive, just pretend that if you don't put the panel, bolt, cap, etc., on right, the aircraft will take off and fly directly over your house and drop the object on your kid, your wife, or maybe even you. Get the message, troops?

Mini Mishap with a Moral

Incident

While passing through FL 200 on climbout, a C-141 suffered a rapid decompression due to a pressure door seal failure. The crew immediately went on oxygen and initiated an emergency descent. Suddenly the crew oxygen pressure went to zero but the quantity gage read 20 liters. By this time the aircraft was passing through 10,000 feet and oxygen was no longer needed, so full attention was devoted to the ensuing landing.

Investigation

On the ground, maintenance soon found the problem. The oxygen pressure shutoff valve had been safetied closed rather than open. When the valve was opened, pressure was immediately restored. But how did it get safetied closed?

During the engineer's preflight inspection the day before, the oxygen shutoff valve safety wire was discovered missing. A maintenance man promptly safety wired the valve, and the system "checked" normal — because of trapped pressure. Three sorties later and after a crew rest at an Alaskan base, the oxygen pressure was noted to be slightly below 300 psi (250-270) but this was attributed to the low temperature (approx -15° F) the aircraft had been subjected to overnight. Having experienced several other problems due to the severe cold, the crew considered the low pressure normal.

During the emergency, only the oxygen in the lines between the valve and the regulators was available, and this was depleted very rapidly. If the flight had been at a higher altitude when the rapid decompression occurred or if other circumstances had developed which required the crew's extended use of oxygen, the results would have been disastrous.

Moral

What isn't clear is why didn't the crew write it up in the AFTO 781A? It's obvious the maintenance man safetied the shutoff valve closed. But, did anyone inspect the work? Would more suspicion of the low oxygen pressure have led to a better check and to discovery of the closed valve? Would *you* have caught this snafu?

after deadline . . . .

CONGRATULATIONS -- It's all over but the shouting and the Dover crews have a lot to shout about: the 436 MAWg won the 1972 Combat Airlift Competition.

WANTED -- Enterprising young man with creative mind and a way with words. Opportunities and future unlimited for the right person. As another editor of THE MAC FLYER completes his tour, we are looking for a replacement. Criteria: MAC aircraft commander, SEA-returnee, captain or major, writing ability, volunteer. Desirable but less necessary: writing experience, art experience. Interested? Write or call for a free Editorial Ability Evaluation Form. No obligation.

EQUIPMENT CHECK -- Now's the time to inventory your winter flying clothing -- before you are knee-deep in snow. In fact, you might as well survey all areas that will need winterizing.

SNOW REMOVAL PLAN -- Do you have one?

MORE ON OXYGEN -- After the pax oxygen item on page 29 was set for publication, we learned of other problems in C-5 oxygen systems. During an emergency activation, crewmen found masks incorrectly packed, hoses kinked, head straps broken, and some masks which failed to deploy. TCTO 1564, which involves system inspection plusinstalling oxygen hose support springs, should solve the problem. Completion date: around 1 November.

OOPS AND BOO-BOOS -- We discovered these errata:

From September: The "Squawk Box" reference to the 1972 writing contest should have said 1973.

From August: In "After Deadline" we mentioned a briefing prepared by MAC/DOT on landing illusions and short landings. Actually, DOT only distributed it; Maj Floyd W. Weaver, 437 MAWg/DOV, prepared the briefing.

COMING ATTRACTIONS -- The November issue will be packed with goodies: icing, turbulence, letters to the editor, mishaps from over-reactions, and a special article about Wake Island AFB.

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